

Environmentally Preferable Coatings For Structural Steel Project

Ground Systems Development And Operations Program

Human Exploration And Operations Mission Directorate (HEOMD)

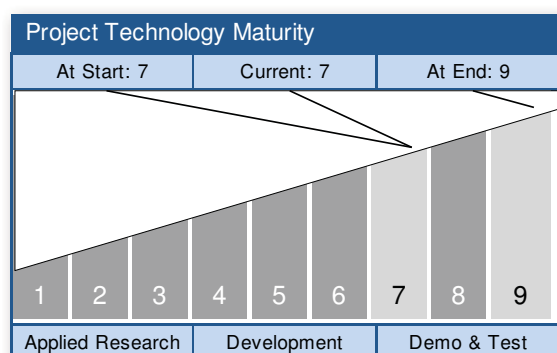
National Aeronautics and
Space Administration



Applying alternative to coupon for testing

ABSTRACT

The Ground Systems Development and Operations (GSDO) Program at NASA John F. Kennedy Space Center (KSC) has the primary objective of modernizing and transforming the launch and range complex at KSC to benefit current and future NASA programs along with other emerging users. Described as the "launch support and infrastructure modernization program" in the NASA Authorization Act of 2010, the GSDO Program will develop and implement shared infrastructure and process improvements to provide more flexible, affordable, and responsive capabilities to a ...***Read more on the last page.***



Technology Area: Ground & Launch Systems Processing TA13
(Primary)

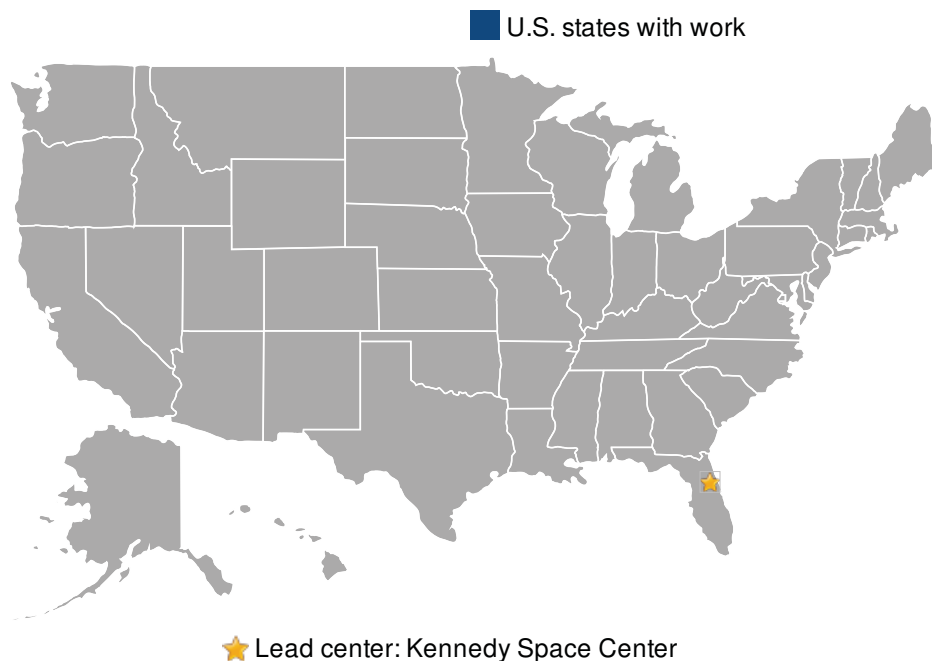
ANTICIPATED BENEFITS

To NASA funded missions:

1. Eliminates risks associated with material obsolescence (limited number of coatings on APL).
2. Reduces environmental, safety, and health concerns of VOCs, hazardous air pollutants, and other hazardous materials.
3. Improved coating performance results in less required maintenance (less down-time), reduced costs, and improved mission readiness.

...

Read more on the last page.



Contributing Partners

Air Force

DETAILED DESCRIPTION

NASA is responsible for a number of facilities/structures with metallic structural and non-structural components in a highly corrosive environment. Metals require periodic maintenance activity to guard against the insidious effects of corrosion and thus ensure that structures meet or exceed design or performance life. The standard practice for protecting metallic substrates in atmospheric environments is the application of corrosion protective coating system. These coating systems work via a variety of methods (barrier, galvanic and/or inhibitor) and adhere to the substrate through a combination of chemical and physical bonds.

Maintenance at NASA John F. Kennedy Space Center (KSC) is governed by NASA-STD-5008B (*Protective Coating of Carbon Steel, Stainless Steel, and Aluminum on Launch Structures, Facilities, and Ground Support Equipment*), which establishes practices for the protective coating of launch facilities used by or for NASA programs and projects. The Standard is also recommended guidance for all NASA ...

MANAGEMENT

Program Executive:
Jason Crusan

Program Manager:
William Simmonds

Project Manager:
Joni Richards

Principal Investigator:
Brian Greene

DETAILED DESCRIPTION (CONT'D)

Centers and is for the design of non-flight hardware used to support the operations of receiving, transportation, handling, assembly, inspection, test, checkout, service, and launch of space vehicles and payloads at NASA launch, landing, or retrieval sites. The criteria and practices contained within the Standard may be applied to items used at the manufacturing, development, and test sites upstream of the launch, landing, or retrieval sites.

NASA-STD-5008B includes an "Approved Products List" (APL) of coatings that have previously been tested and qualified for use. The APL, however, includes coatings that have very high volatile organic compound VOC levels which are no longer compliant with current environmental regulations. Some contain other hazardous constituents that are also subject to regulation. The limited number of approved coatings in NASA-STD-5008B presents an obsolescence risk to NASA if materials should become unavailable.

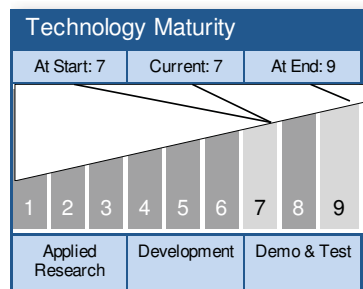
This project will identify and qualify environmentally preferable coating alternatives to determine whether they provide adequate corrosion protection along with other properties such as material compatibility and adhesion for use on NASA ground-based space infrastructure.

ADDITIONAL AND DETAILED TECHNOLOGY AREAS

- TA07: Human Exploration Destination Systems
- TA12: Materials, Structures, Mechanical Systems & Manufacturing
- TA13: Ground & Launch Systems Processing
- TA15: Aeronautics

TECHNOLOGY DETAILS

Environmentally Preferable Coatings For Structural Steel



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This technology is categorized as a material for other applications

- Technology Area
 - TA13 Ground & Launch Systems Processing (Primary)
 - TA07 Human Exploration Destination ...

TECHNOLOGY DETAILS

TECHNOLOGY DESCRIPTION (CONT'D)

Systems (Additional)

- TA12 Materials, Structures, Mechanical Systems & Manufacturing (Additional)
- TA13 Ground & Launch Systems Processing (Additional)
- TA15 Aeronautics (Additional)

CAPABILITIES PROVIDED

Coatings provide corrosion protection for metallic substrates.

POTENTIAL APPLICATIONS

The NASA technical standard for protecting structural steel assets contains a relatively short list of approved coatings, many of which contain high VOC levels. These coatings are no longer compatible with current environmental regulations and pose a materials obsolescence risk. Environmental Coatings will eliminate this risk.

IMAGE GALLERY



Applying alternative to coupon for testing



ABSTRACT (CONTINUED FROM PAGE 1)

multi-user community.

In support of the GSDO Program, the objective of this project is to determine the feasibility of environmentally friendly corrosion resistant coatings for launch facilities and ground support equipment. The focus of the project is corrosion resistance and survivability with the goal to reduce the amount of maintenance required to preserve the performance of launch facilities while reducing mission risk.



ANTICIPATED BENEFITS

To NASA unfunded & planned missions: (CONT'D)

1. Eliminates risks associated with material obsolescence (limited number of coatings on APL).
2. Reduces environmental, safety, and health concerns of VOCs, hazardous air pollutants, and other hazardous materials.
3. Improved coating performance results in less required maintenance (less down-time), reduced costs, and improved mission readiness.

To the commercial space industry:

1. Eliminates risks associated with material obsolescence (limited number of coatings on APL).
2. Reduces environmental, safety, and health concerns of VOCs, hazardous air pollutants, and other hazardous materials.
3. Improved coating performance results in less required maintenance (less down-time), reduced costs, and improved mission readiness.

